

REMARKS

Claims 1, 2, 4, 10 and 11 remain in this application. Claims 3, 5, 6, 7, 8 and 9 have been amended by eliminating multiple dependent claims. Attached hereto is a marked-up version of the changes made to the claims by the current amendment. The attached page is captioned "Version With Markings to Show Changes Made".

The support for these amendments is found in the claims as originally filed. These amendments are being entered to bring the claims into conformance with, *inter alia*, 37 CFR §1.75; no new matter is added.

Respectfully submitted,

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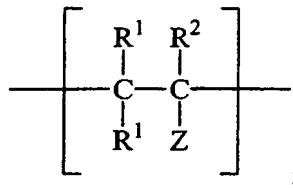
51 Sec'd PCT/PTO 29 AUG 2001

**VERSION WITH MARKINGS TO SHOW CHANGES MADE**

In the claims:

What is claimed is:

1. A detergent compositions comprising:
  - a) from 4% to 70% by weight, of a surfactant;
  - b) from 0.01% to 5% by weight, of a dye maintenance polymer or oligomer, said polymer or copolymer comprising one or more units having the formula:
    - I) linear polymer units having the formula:



wherein each R<sup>1</sup> is independently

- a) hydrogen;
- b) C<sub>1</sub>-C<sub>4</sub> alkyl;
- c) substituted or unsubstituted phenyl;
- d) substituted or unsubstituted benzyl;
- e) carbocyclic;
- f) heterocyclic;
- g) and mixtures thereof;

each R<sup>2</sup> is independently

- a) hydrogen;
- b) halogen
- c) C<sub>1</sub>-C<sub>4</sub> alkyl;
- d) C<sub>1</sub>-C<sub>4</sub> alkoxy;
- e) substituted or unsubstituted phenyl;
- f) substituted or unsubstituted benzyl;
- g) carbocyclic;
- h) heterocyclic;
- i) and mixtures thereof;

each Z is independently

- a) hydrogen;
- b) hydroxyl;
- c) halogen;

d)  $-(CH_2)_mR;$   
wherein R is:

- i) hydrogen;
- ii) hydroxyl
- iii) halogen;
- iv) nitrilo;
- v)  $-OR^3;$
- vi)  $-O(CH_2)_nN(R^3)_2;$
- vii)  $-O(CH_2)_nN^+(R^3)_3X^-;$
- viii)  $-OCO(CH_2)_nN(R^3)_2;$
- ix)  $-OCO(CH_2)_nN^+(R^3)_3X^-;$
- x)  $-NHCO(CH_2)_nN(R^3)_2;$
- xi)  $-NHCO(CH_2)_nN^+(R^3)_3X^-;$
- xii)  $-(CH_2)_nN(R^3)_2;$
- xiii)  $-(CH_2)_nN^+(R^3)_3X^-;$
- xiv) carbocyclic;
- xv) heterocyclic;
- xvi) nitrogen heterocycle quaternary ammonium;
- xvii) nitrogen heterocycle N-oxide;
- xviii) aromatic N-heterocyclic quaternary ammonium;
- xix) aromatic N-heterocyclic N-oxide;
- xx)  $-NHCHO;$
- xxi) or mixtures thereof;

each  $R^3$  is independently hydrogen, C<sub>1</sub>-C<sub>8</sub> alkyl, C<sub>2</sub>-C<sub>8</sub> hydroxyalkyl, and mixtures thereof; X is a water soluble anion; the index n is from 0 to 6

e)  $-(CH_2)_mCOR'$   
wherein R' is

- i)  $-OR^3;$
- ii)  $-O(CH_2)_nN(R^3)_2;$
- iii)  $-O(CH_2)_nN^+(R^3)_3X^-;$
- iv)  $-NR^3(CH_2)_nN(R^3)_2;$
- v)  $-NR^3(CH_2)_nN^+(R^3)_3X^-;$
- vi)  $-(CH_2)_nN(R^3)_2;$
- vii)  $-(CH_2)_nN^+(R^3)_3X^-;$

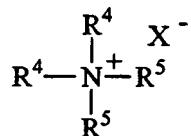
viii) or mixtures thereof;

each R<sup>3</sup> is independently hydrogen, C<sub>1</sub>-C<sub>8</sub> alkyl, C<sub>2</sub>-C<sub>8</sub> hydroxyalkyl, and mixtures thereof; X is a water soluble anion; the index n is from 0 to 6;

f) and mixtures thereof;

the index m is from 0 to 6;

II) cyclic units derived from cyclically polymerizing monomers having the formula:



wherein each R<sup>4</sup> is independently an olefin comprising unit which is capable of propagating polymerization in addition to forming a cyclic residue with an adjacent R<sup>4</sup> unit; R<sup>5</sup> is C<sub>1</sub>-C<sub>12</sub> linear or branched alkyl, benzyl, substituted benzyl, and mixtures thereof; X is a water soluble anion; and

III) mixtures thereof;

provided said polymer or co-polymer has a net cationic charge; and wherein said dye maintenance polymer is not an polyethyleneimine or alkoxylated derivative thereof; and

b) the balance carriers and other adjunct ingredients.

2. A detergent composition according to Claim 1, wherein said dye maintenance polymer is a copolymer comprising:

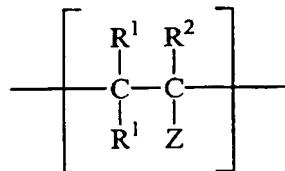
i) a first monomer selected from the group consisting of N,N dialkylaminoalkyl(meth)acrylate, N,N dialkylaminoalkylacrylate, N,N dialkylaminoalkylacrylamide, N,N dialkylaminoalkyl(meth)acrylamide, their quaternized derivatives and mixtures thereof; and

ii) a second monomer selected from the group consisting of acrylic acid, methacrylic acid, C<sub>1</sub>-C<sub>6</sub> alkylmethacrylate, C<sub>1</sub>-C<sub>6</sub> alkyl acrylate, C<sub>1</sub>-C<sub>8</sub> hydroxyalkylacrylate, C<sub>1</sub>-C<sub>8</sub> hydroxyalkylmethacrylate, acrylamide, C<sub>1</sub>-C<sub>16</sub> alkyl acrylamide, C<sub>1</sub>-C<sub>16</sub> dialkylacrylamide, 2-acrylamido-2-methylpropane sulfonic acid or its alkali salt, methacrylamide, C<sub>1</sub>-C<sub>16</sub> alkylmethacrylamide, C<sub>1</sub>-C<sub>16</sub> dialkylmethacrylamide, vinyl formamide, vinylacetamide, vinyl alcohol, C<sub>1</sub>-C<sub>8</sub> vinylalkylether, vinyl pyridine,

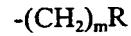
itaconic acid, vinyl acetate, vinyl propionate, vinyl butyrate and mixtures thereof;  
 wherein the copolymer comprises at least 25 mole % of the first monomer.

*Claim 2*

3. A composition according to either Claim 1 or 2 wherein said adjunct ingredients are selected from the group consisting of electrolytes, stabilizers, low molecular weight water soluble solvents, chelating agents, dispersibility aids, soil release agents, nonionic fabric softening agents, concentration aid, perfume, preservatives, colorants, optical brighteners, opacifiers, germicides, fungicides, anti-corrosion agents, antifoam agents, and mixtures thereof.
4. A detergent composition comprising:
  - a) from 4% to 70% of a surfactant;
  - b) from 0.01% to 10% by weight, of a dye maintenance polymer or oligomer, said dye maintenance polymer is selected from the group consisting of homopolymers, co-polymers, ter-polymers and mixtures thereof having the formula:



wherein each R<sup>1</sup>, R<sup>2</sup> is hydrogen or methyl; Z has the formula:



wherein m is equal to 0 or 1; R is



R<sup>3</sup> is selected from the group consisting of hydrogen, C<sub>1</sub>-C<sub>4</sub> alkyl, C<sub>2</sub>-C<sub>4</sub> hydroxyalkyl, and mixtures thereof; X is a water soluble anion; and

- c) the balance carriers and adjunct ingredients.

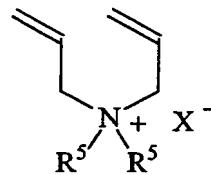
*Claim 4*

5. A composition according to any of Claims 1-4 comprising from 0.1% to 8% by weight of said dye maintenance polymer.

*Claim 5*

6. A composition according to any of Claims 1-5 wherein said dye maintenance polymer is a co-polymer comprising a linearly polymerizing monomers and a

cyclically polymerizing monomer, said cyclically polymerizing monomer having the formula:



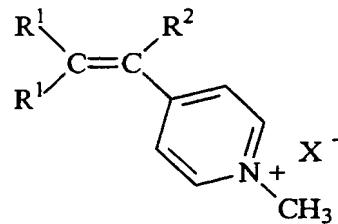
wherein  $\text{R}^5$  is  $\text{C}_1\text{-C}_4$  alkyl, and mixtures thereof;  $\text{X}$  is a water soluble anion.

*Claim 5*

7. A composition according to any of Claims 1-5 wherein the dye maintenance polymer is selected from the group consisting of homopolymers, co-polymers, terpolymers and mixtures thereof, of diallyl dimethylammonium chloride, bromide or methyl sulfate and a co-monomer selected from the group consisting of acrylic acid, methacrylic acid,  $\text{C}_1\text{-C}_6$  alkylmethacrylate,  $\text{C}_1\text{-C}_6$  alkyl acrylate,  $\text{C}_1\text{-C}_8$  hydroxyalkylacrylate,  $\text{C}_1\text{-C}_8$  hydroxyalkylmethacrylate, acrylamide,  $\text{C}_1\text{-C}_{16}$  alkyl acrylamide,  $\text{C}_1\text{-C}_{16}$  dialkylacrylamide, 2-acrylamido-2-methylpropane sulfonic acid or its alkali salt, methacrylamide,  $\text{C}_1\text{-C}_{16}$  alkylmethacrylamide,  $\text{C}_1\text{-C}_{16}$  dialkylmethacrylamide, vinyl formamide, vinylacetamide, vinyl alcohol,  $\text{C}_1\text{-C}_8$  vinylalkylether, vinyl pyridine, itaconic acid, vinyl acetate, vinyl propionate, vinyl butyrate and mixtures thereof.

*Claim 5*

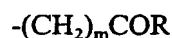
8. A composition according to any of Claims 1-5 wherein said dye maintenance polymer a co-polymer comprising a linearly polymerizing monomers and a cyclically polymerizing monomer, said cyclically polymerizing monomer having the formula:



wherein  $\text{R}^5$  is  $\text{C}_1\text{-C}_4$  alkyl, and mixtures thereof;  $\text{X}$  is a water soluble anion.

*Claim 5*

9. A composition according to any of Claims 1-5 comprising a co-polymer wherein Z has the formula:



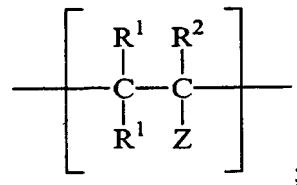
wherein each R is independently  $-\text{O}(\text{CH}_2)_n\text{N}(\text{R}^3)_2$ ;  $-\text{O}(\text{CH}_2)_n\text{N}^+(\text{R}^3)_3\text{X}^-$ ;  $-(\text{CH}_2)_n\text{N}(\text{R}^3)_2$ ;  $-(\text{CH}_2)_n\text{N}^+(\text{R}^3)_3\text{X}^-$ ; and mixtures thereof, m is 0, n is from 2 to 4.

10. A composition according to Claim 1 wherein said dye maintenance polymer comprises copolymer of N-methyl vinyl pyridine and vinyl pyridine in a ratio of 4:1, a copolymer of N-methyl vinyl pyridine and vinyl pyridine in a ratio of 4:6, a co-polymer of poly(N-methyl vinyl pyridine) and vinyl pyridine N-oxide in a ratio of polymer to monomer of 4:1, a polymer comprising poly(N-methyl vinyl pyridine) and vinyl pyridine N-oxide in a ratio of polymer to monomer of 4:6, and mixtures thereof.

11. A method for reducing the loss of fabric dye comprising the step of contacting dyed fabric with a laundry detergent comprising:

- from 4% to 70% by weight, of a surfactant;
- from 0.01% to 5% by weight, of a dye maintenance polymer or oligomer, said polymer or copolymer comprising one or more units having the formula:

I) linear polymer units having the formula:



wherein each R<sup>1</sup> is independently

- hydrogen;
- C<sub>1</sub>-C<sub>4</sub> alkyl;
- substituted or unsubstituted phenyl;
- substituted or unsubstituted benzyl;
- carbocyclic;
- heterocyclic;
- and mixtures thereof;

each R<sup>2</sup> is independently

- hydrogen;
- halogen
- C<sub>1</sub>-C<sub>4</sub> alkyl;
- C<sub>1</sub>-C<sub>4</sub> alkoxy;
- substituted or unsubstituted phenyl;

- f) substituted or unsubstituted benzyl;
- g) carbocyclic;
- h) heterocyclic;
- i) and mixtures thereof;

each Z is independently

- a) hydrogen;
- b) hydroxyl;
- c) halogen;
- d)  $-(CH_2)_mR$ ;

wherein R is:

- i) hydrogen;
- ii) hydroxyl
- iii) halogen;
- iv) nitrilo;
- v)  $-OR^3$ ;
- vi)  $-O(CH_2)_nN(R^3)_2$ ;
- vii)  $-O(CH_2)_nN^+(R^3)_3X^-$ ;
- viii)  $-OCO(CH_2)_nN(R^3)_2$ ;
- ix)  $-OCO(CH_2)_nN^+(R^3)_3X^-$ ;
- x)  $-NHCO(CH_2)_nN(R^3)_2$ ;
- xi)  $-NHCO(CH_2)_nN^+(R^3)_3X^-$ ;
- xii)  $-(CH_2)_nN(R^3)_2$ ;
- xiii)  $-(CH_2)_nN^+(R^3)_3X^-$ ;
- xiv) carbocyclic;
- xv) heterocyclic;
- xvi) nitrogen heterocycle quaternary ammonium;
- xvii) nitrogen heterocycle N-oxide;
- xviii) aromatic N-heterocyclic quaternary ammonium;
- xix) aromatic N-heterocyclic N-oxide;
- xx)  $-NHCHO$ ;
- xxi) or mixtures thereof;

each  $R^3$  is independently hydrogen,  $C_1-C_8$  alkyl,  $C_2-C_8$  hydroxyalkyl, and mixtures thereof; X is a water soluble anion; the index n is from 0 to 6

- e)  $-(CH_2)_mCOR'$

wherein R' is

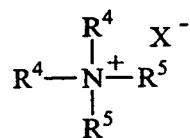
- i) -OR<sup>3</sup>;
- ii) -O(CH<sub>2</sub>)<sub>n</sub>N(R<sup>3</sup>)<sub>2</sub>;
- iii) -O(CH<sub>2</sub>)<sub>n</sub>N<sup>+</sup>(R<sup>3</sup>)<sub>3</sub>X<sup>-</sup>;
- iv) -NR<sup>3</sup>(CH<sub>2</sub>)<sub>n</sub>N(R<sup>3</sup>)<sub>2</sub>;
- v) -NR<sup>3</sup>(CH<sub>2</sub>)<sub>n</sub>N<sup>+</sup>(R<sup>3</sup>)<sub>3</sub>X<sup>-</sup>;
- vi) -(CH<sub>2</sub>)<sub>n</sub>N(R<sup>3</sup>)<sub>2</sub>;
- vii) -(CH<sub>2</sub>)<sub>n</sub>N<sup>+</sup>(R<sup>3</sup>)<sub>3</sub>X<sup>-</sup>;
- viii) or mixtures thereof;

each R<sup>3</sup> is independently hydrogen, C<sub>1</sub>-C<sub>8</sub> alkyl, C<sub>2</sub>-C<sub>8</sub> hydroxyalkyl, and mixtures thereof; X is a water soluble anion; the index n is from 0 to 6;

- f) and mixtures thereof;

the index m is from 0 to 6;

- II) cyclic units derived from cyclically polymerizing monomers having the formula:



wherein each R<sup>4</sup> is independently an olefin comprising unit which is capable of propagating polymerization in addition to forming a cyclic residue with an adjacent R<sup>4</sup> unit; R<sup>5</sup> is C<sub>1</sub>-C<sub>12</sub> linear or branched alkyl, benzyl, substituted benzyl, and mixtures thereof; X is a water soluble anion; and

- III) mixtures thereof;

provided said polymer or co-polymer has a net cationic charge; and wherein said dye maintenance polymer is not an polyethyleneimine or alkoxyated derivative thereof; and

- b) the balance carriers and other adjunct ingredients.